

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

**International University of Africa**

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# **Effect of Potassium Bromate on the Liver of Wistar rats**

**A thesis Submitted in Partial fulfillment for the  
Requirements of the Degree of M.Sc in Biochemistry.**

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**2018**

# الآية

قال تعالى :

{ الَّذِي خَلَقَنِي فَهُوَ يَهْدِينِ \* وَالَّذِي هُوَ يُطْعِمُنِي وَيَسْقِينِ \*

وَإِذَا مَرِضْتُ فَهُوَ يَشْفِينِ }

صدق الله العظيم

سورة الشعراء الآيات : (78-80)

## *Dedication*

*To my loving parents*

*Those who lightened my way with their care*

*To my mother , and aunt Alwia ,*

*To Those who supported me in this bright station in my life*

*To my brother and sisters*

*To Those who shared me the best moments of my life*

*To my large family members*

*Those who gave me the respect as a way to the people heart*

*To my dear mother basmat*

*Your words like a candle that lightened my way to success*

*I dedicate this work*

*Alrasheid*

### ***Acknowledgments:***

*Thanks at first to Allah, the greatest who gave me the ability and power to carry out this work*

*My thanks are extended unlimitedly to my supervisor*

*Prof. Mohammed Elsheikh Barri*

*Who advised and helped me to construct this work.*

*Special thanks for the unlimited valuable help from*

*Prof Halima and all the family of histopathology at central Veterinary Resarch laboratry (CVRL)*

*My thanks to Mohammed Al-daw and the family of the faculty of Veterinary Medicine, University of Khartoum ,who helpd me to do high quality of work*

*Thank you very much all my friends in my work and in the department of bio chemistry (Prof khalid Eltom and Prof Osman and Dr: Fatima Elsammani ) and everyone who supported this work and made it clear and acceptable*

## Abbreviations

Term	Abbreviation
KBrO <sub>3</sub>	Potassium bromated
KC	Kupffer cells
HSCs	Hepatic stellate cells
ALT	Alanine transaminase
AST	Aspartate transaminase
LD	Lethal dose
LPO	Lipid peroxidation
PPb	Part per billion
ROS	Reactive oxygen species
BUN	Blood urea nitrogen
OS	Oxidative stress
AO	Anti oxidants
PKC	Palm kernel cake
DNPH	Dinitrophenyl hydrazine
MDH	Malate dehydrogenase
H&E	Hematoxyline and Eosin

## Abstract

The present study was carried out to investigate the toxic effect of exposure to potassium bromate ( $\text{KBrO}_3$ ) on liver of albino rats. Thirty rats were divided randomly into 6 groups and treated with potassium bromate at doses of 0, 140, 170, 170, and 200 mg/kg body weight respectively for 21 days. and rats in group C were treated for two more weeks. The results showed normal weight gain in Group A control group, and weight reduction in third weeks in groups (B, C, D and F), but in group E with vit E showed a significant gain weight, the mortality was 100% in rats treated with 170 mg/kg Bwt after 5<sup>th</sup> week, at the end of week two 50% from rats were dead which received (140, 170 and 200 mg/kg Bwt). In the rats treated with 140, 170 and 200 mg/kg Bwt showing a significant elevation of alanine transaminase (ALT) and aspartate transaminase (AST) and a significant decrease in total protein. In group treated with 200 mg/kg Bwt of  $\text{KBrO}_3$  with vit E showed a significant decrease in ALT&AST and increase in total protein. Histopathological examination showed severe congestion of central veins and sinusoids, dilatation of liver sinusoids. Loss of hepatic architecture, vesicular nuclei, relative increase in Kupffer cells in liver of the groups treated with 140, 170, and 200 mg/kg Bwt, in the kidney, glomeruli were dilated with some glomerular tuft shrinking or segmented congestion of blood vessel with some areas of hemorrhage, Necrosis of lobular epithelioid, group 200 mg/kg Bwt with vitE showed less necrosis compared to other groups, These results suggested that the toxic effects of potassium bromate were more severe in Long-term exposure.

## المستخلص

تعطي الدراسة الحالية لتقصي الأثر السمي لبرومات البوتاسيوم على كبد الفئران من نوع ألبينو. عندما تعطي برومات البوتاسيوم بجرعات مختلفة . طبقت هذه الدراسة علي ثلاثين فأراً وزعت عشوائيا ل6 مجموعات، وأعطيت برومات البوتاسيوم عن طريق الفم بجرعات 0،140،،170،170، و 200 ملجم/كجم من وزن الجسم علي التوالي لمدة 21 يوماً ، الفئران في المجموعة C عولجت لمدة إسبوعين زيادة . لوحظ زيادة معنوية في وزن الجسم في مجموعة A التحكم ونقصان في وزن الجسم في الاسبوع الثالث في مجموعات ( A ,B , D , C و F ) ولكن مجموعة 200 ملجم/كجم فايتمين E لوحظ زيادة معنوية في وزن الجسم ، حدثت الوفاة بنسبة 100% في الفئران التي تم تجريعها ب170 ملجم/كجم وزن الجسم لمدة 5 اسابيع ، في نهاية الاسبوع الثاني حدثت الوفاة بنسبة 50% من الفئران التي أستقبلت (200،170،140 ملجم/كجم وزن الجسم). هذا وقد لوحظ زيادة معنوية في الفئران التي جرعت ب 140، 170، و 200 ملجم/كجم وزن الجسم في نشاط الالنين ترانز امينيز و الاسبارتيت ترانز امينيز ونقصان معنوي في البروتين الكلي . المجموعة التي عولجت ب 200 ملجم/كجم وزن الجسم مع فايتمين E لوحظ نقصان معنوي في نشاط الالنين ترانز امينيز و الاسبارتيت ترانز امينيز وزيادة معنوي في البروتين الكلي . في إختبارات الهستوباثولوجي لوحظ أن الفئران التي تم تجريعها ب140 و170 و200 ملجم/كجم وزن الجسم حدث فيها احتقان حاد في الوريد المركزي وتجويف الكبد ونقصان في خلايا الكبد الدفاعية وفي الكلي ، ولوحظ توسع في مصفي الكليه وإنكماش في مجري الدم ونزيف ؛ وفي المجموعة التي جرعت ب200 ملجم/كجم وزن الجسم مع فايتمين E لوحظ اقل سمية مقارنة مع المجموعات الاخرى . من هذه النتائج يتضح أن الأثر السمي لبرومات البوتاسيوم كان أكثر حدة كلما زاد زمن التعرض لمادة البوتاسيوم بروميد .

## Table of contents

Serial No.	Content	Page No.
1	الآية	I
2	Dedication	II
3	Acknowledgement	III
4	Abbreviation	IV
6	English abstract	V
7	Arabic abstract	VI
9	Table of contents	VII
10	List of tables	IX
11	List of figures	IX
<b>Chapter One : Introduction</b>		
1.	Introduction	1
1.2	Rationale of the study	3
1.3	Objectives	4
1.3.1	General objective	4
1.3.2	Specific objectives	4
<b>Chapter Two: literature Review</b>		
2.	Literature review	5
2.1	Physicochemical Properties of potassium bromated	6
2.2	Metabolism of potassium bromate in animal and human	7
2.3	Uses and action	7
2.4	Toxicity and Safety	8
2.5	Detection of potassium bromated	11
2.6	The liver	11
<b>Chapter Three: Material and Methods</b>		
3.1	Material and Experimental Design	12
3.1.1	Potassium Bromate (KBrO <sub>3</sub> )	12
3.1.2	Experiment design	12
3.2	Experimental Animals	13
3.3	Feed	13
3.4	The Experimental group	13
3.5	Biochemical methods	14



3.5.1	Blood Sampling	14
3.5.2	Biochemical Measurements	14
3.5.2.1	Total protein determination	14
3.6	Estimation of Alanine Transaminase (ALT/GPT)	15
3.7	Estimation of aspartate aminotransferase (AST/GOT)	16
3.8	Histopathological Methods	16
3.9	Statistical Analysis	16
<b>Chapter Four:Results</b>		
4.1	Observation	17
4.1.1	Clinical Signs and Mortality	17
4.1.2	Body Weight	17
4.2	Biochemical Results	18
4.3	Histopathological Findings	20
<b>Chapter Five</b>		
5.1	Discussion	29
5.2	Conclusions	31
5.3	Recommendations	32
4.4	References	33

## List of tables

<b>Table No.</b>	<b>Title</b>	<b>Page</b>
1	The mean body weight (mg) of rats orally treated with various levels of potassium bromated	18
2	Serum levels of liver enzymes and measurement of total protein in rats treated with various levels of potassium bromated	19

## List of figures

Figure No	Title	Page
1	Average Body Weights	18
2	Average Serum levels of liver enzymes and protein in the different study groups treated by potassium bromated	19
3&4	Photomicrograph of a Liver section in the group treated with 140mg/L KBrO <sub>3</sub>	21
5&6	Photomicrograph of a kidney section in the group treated with 140mg/L KBrO <sub>3</sub>	22
7&8	Photomicrograph of a Liver section in the group treated with 170mg/L KBrO <sub>3</sub>	23
9&10	Photomicrograph of a Liver section in the group treated with 170mg/L KBrO <sub>3</sub>	24
11&12	Photomicrograph of a kidney section in the group treated with 170mg/L KBrO <sub>3</sub>	25
13&14	Photomicrograph of a Liver section in the group treated with 200mg/L KBrO <sub>3</sub>	26
15	Photomicrograph of a Liver section in the group treated with 200mg/L KBrO <sub>3</sub>	27,28
16&17	Photomicrograph of a kidney section in the group treated with 200mg/L KBrO <sub>3</sub>	28
18	Photomicrograph of a kidney section in the group treated with 200mg/L KBrO <sub>3</sub> with vitamin E	28